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THE VETERINARY JOURNAL

A MONTHLY REVIEW OF VETERINARY SCIENCE

Est. 1875

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CONTENTS.

PAGE

OBITUARY—

Orlando Charnock Bradley, M.D., D.Sc., F.R.C.V.S., F.R.S.E. ... 435

EDITORIAL—

Farewell, 1937 ... 436

Students Fête Sir Frederick Hobday ... 437

GENERAL ARTICLES—

Trichinosis—A Public Health Problem
By Thomas W. M. Cameron ... 439

Clinical Aspects of Veterinary State Medicine.
By W. P. Blount, F.R.C.V.S. ... 442

Chloral Hydrate Anæsthesia by Intravenous Injection in Horses and Cattle.
By Richard Hudson, F.R.C.V.S. ... 452

ABSTRACTS OF CURRENT LITERATURE ... 454

REVIEWS ... 459

NEWS ... 461

PLATES—

Orlando Charnock Bradley, M.D., D.Sc., F.R.C.V.S., F.R.S.E (*Frontispiece*)

Presentation to Sir Frederick Hobday.

The Artificial Insemination of the Cow.
(*Article by* Professor Dr. Kust)

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DECEMBER, 1937

Obituary

ORLANDO CHARNOCK BRADLEY, M.D., D.Sc., F.R.C.V.S., F.R.S.E.

DR. BRADLEY died on November 21st, 1937, after a short illness. So passed a landmark in the evolution of the profession and a man well beloved by his fellows. Bradley was an Englishman who became a Scotsman by adoption, adoption not all of his own volition, for the men of the North, recognising his worth, were loath to let him go. Born in Lancashire in 1871, in due course he proceeded to Edinburgh, and he graduated as M.R.C.V.S. from the New College in 1892. Then followed a period as assistant to Principal Williams. He took up his life work on anatomy, and during this period he studied for a medical degree, graduating M.B., Ch.B. Edinburgh, in the year 1900. In the same year he was appointed to the Chair of Anatomy in the Royal Dick Veterinary College, a college which was destined to become Bradley, and Bradley the College. He was appointed Goodsir Memorial Fellow in his university in 1903, and his research work was recognised by the award of the degree of D.Sc. in 1905. In 1907 he took the M.D. degree.

Dr. Bradley was elected to the Council of the R.C.V.S. in 1911, he was its President in the years 1920–22. He took an active part in the formation of the N.V.M.A. as at present constituted. He was twice elected President. He was a member of the B.M.A., and he was elected by that body to occupy the Presidential Chair of the Section of Comparative Medicine at the annual meeting in Edinburgh in 1927.

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He was elected a Fellow of the Royal Society of Edinburgh, and of the R.C.V.S. Bradley's contributions to scientific literature were many ; his anatomical works on the horse, dog, and fowl, became standard text-books. During the years 1900–1911 Bradley was laying a foundation which was to stand him in good stead when he was called to the principalship of the Dick College in 1911. The Governors of the College could not have made a better choice. The old college in Clyde Street had served its day. New buildings were urgently necessary, and funds for this purpose had to be procured. How well he succeeded is shown by the splendid College the northern capital now possesses. Buildings alone do not make a College. Bradley gathered good men around him, and together they built up an academic reputation for the College second to none. For all his academic distinction and honours, Bradley the man kept a level keel. Always the same, and the same to all. In his company one felt the presence of a benevolent master—a man who was dignified, strict, and somewhat austere, yet to whom one would go for help or sympathy if ever the occasion arose.

Bradley was a great believer in discipline, and during his regime an order and sense of responsibility pervaded his College such as was evident in his own life. Off duty he was a charming companion and host, and one who inspired a love of all that was kind and beautiful. To his old students and friends all over the world Bradley's passing leaves a void which can never be filled, but loving memories of a noble character will justify the epitaph : " He was well beloved."

Editorial

FAREWELL, 1937.

THE year which is now drawing to its close has been a momentous one to the veterinary profession. It has witnessed the graduation and launching on their professional careers of the first batch of students who have studied under the rules of the five-year course. There is no doubt that the four-year course was a well-balanced one, and that it served its purpose admirably. The Royal College of Veterinary Surgeons is charged with the duty of keeping veterinary education abreast of the times. The new curriculum is an attempt to fulfil this duty. It might be said that the existence or otherwise of our treasured one-portal system depends upon the results of the new scheme. A one-portal system must give a maximum efficiency. Our young graduates have a great responsibility, and we make no excuses if we remind them of this responsibility. It is by their conduct in their professional life that our educational system will be judged.

For some time it has been evident that mechanisation was slowly but surely encroaching upon the domain of the horse. In no sphere is this more marked than in our Army. 1937 will have sad memories for all who are serving or have served

PRESENTATION TO SIR FREDERICK HOBDAY.

The Students' Union Society, Royal Veterinary College and Hospital, gave a Presentation Dinner to Sir Frederick Hobday, Principal and Dean, 1927–1937. Sir Frederick was presented with a silver model of "Solario," the famous racehorse, at the Dinner.

Sir Frederick Hobday receiving the model from Mr. Jim Ridge, Chairman of the Students' Union Society. On right is Lady Hobday.

in the R.A.V.C. The status of the head of the Corps has been reduced. Surely this could have been avoided if the services of the Veterinary Corps had been utilised to their fullest extent. Remounts duty and the supervision of animal food products would more than compensate for any loss of work in other directions. A Veterinary Corps is an important part of an army in peace; in war it is a vital necessity. If the attractions and prospects of an Army life are poor in peace time, it is likely that there may be irremediable difficulties should war arise.

1937 has seen the completion of the new main block of the Royal Veterinary College at Camden Town. The College and profession were honoured by the presence of Their Majesties at the opening ceremony. Great things are expected of the rejuvenated College. We firmly hope that its great traditions will be upheld, and that it has entered upon another era of fame.

During the latter half of the year the country has suffered from a serious outbreak of foot-and-mouth disease. As usual, the old cry of treatment *versus* slaughter is with us. At one time it was said that an Englishman was always an expert horseman. Nowadays, probably owing to mechanisation, he turns his attention to cattle. Judging from a perusal of the lay press, it would appear that he is an expert on cattle and their diseases, particularly foot-and-mouth disease. Our sympathies go out to the veterinary officials of the Ministry of Agriculture who, in the face of many difficulties, are charged to carry out the only known effective procedure suitable for this country, *i.e.*, the slaughter policy.

So passes 1937: a year of change, a year of incident. Let us hope that 1938 will provide further opportunities for the professional and social advancement of our profession, and that one and all may have a happy and prosperous new year.

Welcome, 1938!

STUDENTS FÊTE SIR FREDERICK HOBDAY.

TUESDAY, November 16th, witnessed a remarkable tribute paid to Sir Frederick Hobday by students, past and present, of the Royal Veterinary College and the lay staff. The occasion took the form of a dinner at which presentations were made to Sir Frederick and Lady Hobday. The scene was the Refectory of the new College. It was packed beyond capacity by an enthusiastic company gathered to honour the man who had made possible such a gathering in the old school. This unrestrained and spontaneous recognition of the man, his life, and work, must have done much to remove any doubts, if such were possible, that Sir Frederick may have felt during recent times. Those present included members of the staff, old graduates and friends, many of whom had travelled great distances to pay their tribute of honour.

An excellent repast was provided by Mrs. Lawrence and her staff, and following the Loyal Toast, Mr. Jim Ridge, President of the Students' Union, rose to submit the toast of the evening. In an able speech he told of their love and appreciation of their late chief, and of the great work that Sir Frederick had done on behalf

of the college and profession. He passed in review all the troubles and trials associated with the rebuilding. He compared the old College with the new, and said that Sir Frederick had accomplished something which no other man in the profession could or would undertake. Sir Frederick was recognised all over the Empire as the man who had made the new College possible. (Prolonged applause.) Mr. Ridge then presented to Sir Frederick a model in silver of Solario, and to Lady Hobday a leather-bound memorandum book. On behalf of all past and present students he asked Sir Frederick to accept this gift. The gift could in no way represent the sum of their affection for their chief, but he trusted that during the years to come this tribute would bring to Sir Frederick's mind the memory of the happy times he had spent amongst those hundreds of students, past and present, for whom he had done so much and to whom he meant so much. (Loud applause.)

When Sir Frederick rose to reply he was given a tumultuous reception with musical honours. He thanked them one and all, on behalf of Lady Hobday and himself, for their kind thoughts and the reception they had given them that evening. He reviewed the history of the College from the time of his student days. His many reminiscences were much enjoyed, particularly those relating to that worthy " Old Bill." He said that it was just over fifty years since he entered the College as a student. He had never regretted it, and he had enjoyed every minute of his veterinary life. He counselled the students to make the most of their time, especially that employed in pupilage. The time to see practice was when one was young and at a receptive age.

Sir Frederick paid a great tribute to his wife. He had been blessed by a good helpmate. To her was due a great measure of such success as had come his way. " They would value the remembrance of this evening to the end of their lives."

On resuming his seat Sir Frederick was again greeted with tumultuous and prolonged applause.

Dr. S. E. Piercy proposed the toast of the Principal, and Professor Buxton replied. The Toast of the " Union Society " was in the capable hands of Professor Wooldridge, who in a reminiscent and humorous vein sketched the history of the Society. Professor Wright replied.

During the evening Mr. Parry Jones, the famous tenor, and Mr. Jack Hassall entertained the company. Before the proceedings terminated there were loud calls for " Gerty," Mrs. Lawrence, the canteen manageress. She was received as only students can receive those they appreciate, and on behalf of all present Mr. Ridge thanked her for her great efforts which had made the evening so enjoyable.

And to the singing of " Auld Lang Syne," so ended an evening which will live for ever in the memory of those who were privileged to be present. The spirit of the occasion can best be described by those old words: " Farewell, but not goodbye."

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General Articles

TRICHINOSIS—A PUBLIC HEALTH PROBLEM.

By THOMAS W. M. CAMERON,

Director, Institute of Parasitology; Professor of Parasitology, McGill University, Macdonald College, P.Q.

JUST over a century ago James Paget, while a medical student at Bart's, discovered the Trichina, which was described a few years later (1835) by Owen. For many years it was regarded as somewhat of a curiosity, until about 1860, when Virchow, Leuckart and Zeuker all drew attention to its pathogenicity and importance as a cause of human disease. In the decade following it created a panic in Germany and was more feared than cholera or the plague, and as a result the elaborate pork inspection still in force was introduced. This failed to eradicate it, and imported American pork was blamed as the important source of infection; ultimately all pork intended for export to Germanic countries was inspected for Trichina in the United States, and this inspection continued from 1898 until 1906, when it was abandoned.

The Anglo-Saxon countries never took Trichinosis seriously, in spite of the fact that the parasite was discovered in London, and that as long ago as 1842 Bowditch recorded what is obviously clinical trichinosis from Boston. The United States and Canada did pay rather more attention to it than did Great Britain, both countries going so far as to insist that all pork products intended for uncooked consumption, produced in packing houses under Federal inspection, should be treated by heat, cold or chemicals so as to render any larvæ which they might contain, non-infective. Dr. A. E. Cameron, Chief Veterinary Inspector for Canada, has recently summarised these regulations as follows:

"The meat may be stored for twenty days at a temperature not higher than 5° F., or all parts of the flesh may be heated at a temperature not lower than 137° F. Sausage meat may be salted in pieces not exceeding ¾ in. diameter, with 3½ pounds of salt to each hundred pounds of meat. After the sausages are stuffed they are placed in a drying room for twenty days at a temperature not lower than 45° F. Hams may be dry-cured for forty days at a temperature not lower than 36° F. by salting with four pounds of salt per hundredweight. They should be examined at least once during this period and additional salt may be applied to the lean meat if necessary. Hams may also be pumped with pickle if desired. After curing, they may be soaked in water at a temperature not higher than 70° F. for not more than 15 hours, during which time the water may be changed once. Finally, they are pale-dried or smoked for not less than ten days at a temperature not less than 95° F."

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All three countries, however, relied on the cook in other respects, and no steps were taken to deal with the private vendor or the home producer of uncooked pork. Indeed, for the past twenty-five years the subject has gradually been receding from the public attention. The creation of our meat inspection systems has in fact caused the layman to believe that all inspected meat is free from any infection communicable to man, and few even suspect that the *only* infection which is at all commonly conveyed to human beings by meat is not even looked for in Britain, Canada or the United States.

The Germanic countries, on the other hand, have systematically inspected pork for the presence of Trichina. Small pieces of pork from the region of the central tendons of the diaphragm are squeezed between two pieces of plate glass (the compressorium) and examined by means of a low-power projection microscope (the trichinoscope). Six minutes, including the time required for cleaning the apparatus and recording the results, are allowed for each pig. The system is expensive, and can be relied upon only to detect comparatively heavy infections.

Within the past few years various workers in the United States have made elaborate human post-mortem examinations for the presence of the parasite in unselected cases which have not been diagnosed as trichinosis during life. The result has been to show a probable human infection in the States of approximately 17 per cent. ; there is reason to believe that the rate for Canada is somewhat similar. In other words, some 23 million persons in North America are harbouring this parasite. Some of these, it is true, harbour so few as to have had no symptoms at any time ; others, however, have been seriously ill, and some will die from the disease, although in most cases it will never be suspected and the condition will be diagnosed as some other infection. There is no doubt whatever that trichinosis is a public health problem of major importance in North America. We have no data on its prevalence in Great Britain : every now and again, however, an outbreak is reported, and we can be sure that it is by no means as uncommon as is generally supposed.

The Trichina is essentially a parasite of flesh-eating mammals, and it is probably a natural parasite of the carnivora. It shows little host specificity, however, and it will live in practically any mammal. So far as man is concerned, the pig is the only important source of infection. Pigs in North America, however, have an infection rate of under 2 per cent., and it is now generally accepted that the main source of infection of these animals is uncooked meat garbage, rats and mice playing at most a minor rôle. Canada insists on all garbage being cooked before feeding to pigs, although no such law is in force in the United States. This law, at least so far as the larger producers are concerned, seems to be quite generally observed.

Human trichinosis is generally subclinical, and most cases do not receive medical attention. Clinical cases are by no means infrequent, but owing to the great variety of the symptoms, are generally wrongly diagnosed ; not even syphilis

can imitate so many different diseases. These clinical cases almost always are traceable to locally slaughtered pork which is eaten uncooked, and quite extensive outbreaks may be caused by a single hog. In one recent outbreak in the State of Maine, for example, it was found that a single animal eaten by seventy-one persons produced clinical symptoms in fifty-six of these, with serious illness in twenty-six, and death in two cases. Pork products intended for uncooked consumption, manufactured by firms under federal inspection both in Canada and the U.S., are very seldom a cause of clinical trichinosis.

The high incidence of sub-clinical trichinosis, however, is probably traceable to cooked pork. In spite of our belief that the Anglo-Saxon peoples over-cook pork, there is no doubt whatever that it is often not cooked sufficiently to destroy the encysted parasites. Thus Spink and Augustine recently made a careful analysis of 65 cases of trichinosis in Boston. In 30 of these the history could not be traced. Of the remaining 35, however, in only three cases was the pork eaten uncooked; in 15 cases the source was cooked pork sausages; in nine, boiled ham; in six, cooked pork chops; in one, fried ham; and in one, cooked porkspare ribs. As Hall has recently pointed out, this subclinical trichinosis is probably of relatively recent origin. The incidence of porcine trichinosis has not greatly altered, but in the days before packing plants were so highly organised, pork products such as sausage were made from " trimmings " of individual hogs. If any particular pig were infected, persons eating the sausages from it were very liable to contract clinical trichinosis. This is still the case with the private producer, of course, but it has ceased to be the practice with the large manufacturers. They use " mixed " trimmings from many hogs. Only a few of these are infected, and this infected pork is diluted with the non-infected, so that any one sausage contains only a few larvæ. Consequentiy, while the chances of infected pork are now increased, that infection will be slight, and even partial cooking would still further reduce it. While thorough cooking is a definite means of prevention, it must be emphasised that the pork should be cooked until all the natural colour is gone.

Trichinosis, contrary to the general belief, is an important public health problem in the Anglo-Saxon countries, and demands more intensive investigation than it has hitherto received. In spite of very promising intradermal and serum tests, it is still very difficult to diagnose during life, and even if diagnosed it is very difficult to treat. Much can be done even now, however, by proper education of the public, by the consumption of well-cooked pork or of pork which has been previously treated, under official supervision, to destroy any larvæ, and above all, by a very thorough cooking of pork, especially pork sausages, produced by small producers or by private individuals.

XUM

CLINICAL ASPECTS OF VETERINARY STATE MEDICINE.

By W. P. BLOUNT, F.R.V.C.S.

Chief Veterinary Officer, East Sussex County Council, Lewes, Sussex.

It is sometimes felt that the veterinarian engaged in a full-time capacity with a local authority has little scope for clinical work, but although opportunities and subject matter may be somewhat limited, they can, nevertheless, be extremely interesting. The following observations are based on notes recorded during the past few months.

The Diagnosis of Anthrax.

The procedure at present in operation regarding the diagnosis of anthrax, as is well known, has been in force for a great number of years. The county veterinary inspector can say, " No, this is a negative case " ; but he may not say " Yes, this is a case of anthrax." If, however, he has reasonable gounds for suspicion, material is sent to the Ministry for confirmation and actual diagnosis, the carcase being disposed of as if it actually were anthrax. In order to be on the safe side, it is not unreasonable to expect that numbers of cases are dealt with as " suspicious " ; but were more time spent by the inspector on the original blood examination, many such cases would prove to be negative, and of the remainder, it should not be difficult in the great majority to decide definitely when anthrax *is* present. Therefore, in the opinion of the writer, the number of doubtful cases could be reduced very considerably. The existing uncertainty is probably due to the fact that present-day diagnosis depends almost entirely upon the " MacFadyean " reaction and the fact that the veterinary inspector uses his microscope as though his knowledge of it were no greater than that of his predecessors of twenty-five or more years ago. Polychrome methylene blue stain is frequently used without real appreciation of the fundamentals underlying its use, as so ably explained by MacFadyean in his original article in 1903. Furthermore, it may be considered rare for an inspector to attempt to confirm his bacteriological diagnosis by the use of other staining methods. Yet many such veterinarians hold post-graduate diplomas in Veterinary State Medicine.

Before a veterinary surgeon is appointed to deal with the inspection of suspected anthrax carcases, he should be made quite familiar with the appearance of the causal bacilli in blood smears, correctly stained MacFadyean, Gram, and Johne. For example, in the first-named method the specific reaction will fail to occur if (1) the preliminary fixation of the slide is by heat over 150° F., or by corrosive sublimate, osmic or formic acids ; (2) the method of fixation also fixes the red blood corpuscles ; (3) the bacilli are wholly and firmly fixed.

Since the specific reaction is due to the presence of amorphous debris derived from the capsules of the bacilli, it follows how futile it will be to search for typically encapsulated bacilli. Similarly, as an aid to the production of the satisfactory

MacFadyean reaction, the smear should be relatively thick, whereas if other methods of staining are employed which do stain the capsule *in situ* the film should be relatively thin. It is interesting to note that bacilli from artificial laboratory cultures do not give the purple detritus effect, and also that with storage the reaction automatically disappears.

To the uninitiated two features frequently appear confusing in the examination of positive blood films, namely, the fact that anthrax " bacilli " may appear in long chains, and even when individual organisms are examined they appear in two forms—long and short—the former being twice the length of the latter. Both must be considered physiological: the chains are a distinctive morphological feature, and the apparent duplicity of form is due essentially to the fact that normal growth is always followed by *fission*—the only method of multiplication (reproduction) available to the bacillus.

The factors controlling sporulation have been well described by MacFadyean (1898), and should be studied by all who may be called upon to advise regarding the treatment of infected pastures. In this country, except in the hottest weather and where prompt attention has been given to the diagnosis, there is a strong probability that sporulation will not take place under eighteen hours. Anthrax bacilli are relatively easily killed, and therefore 1 : 500 percloride of mercury, or 1 : 250 Caporit solution (70 per cent. available chlorine), should prove efficient as germicides. The latter is probably the better since it is far less toxic than mercury and has no coagulatory effect on blood proteins.

Pathogenesis.

The general impression regarding anthrax is that in cattle it is septicæmic, whereas in the horse and pig it frequently appears localised to the throat. (Similarly, in malignant pustule of man the infection remains limited.) As a fact, however, the modern conception of anthrax pathologically is to the effect that in practically every case of the disease it commences with the bacilli localised to the mucosæ or the dermis. Until the organisms penetrate the sub-epithelial and later the glandular lymphatic systems, the infection will not become systemic, and it therefore follows bacilli cannot be recovered from the peripheral circulation unless a septicæmia has occurred. If the local infection causes œdema and swelling of such a magnitude as to compress vitally important structures (*e.g.*, those of the throat) then no doubt death can occur from asphyxiation alone ; otherwise, providing the infection does not spread to involve the blood stream, an animal will have a reasonable chance of recovery. In this respect, there is little doubt a number of affected animals do recover annually, but seldom or never following the stage of septicæmia. However, there does not seem to have been any satisfactory explanation why the localised throat lesions predominate in the horse and pig and not in the ox, unless the incidence is perhaps as great in the cow, but the resistance of the tissues less, so that the septicæmic state follows more rapidly than in the former animals.

XUM

Peracute Anthrax in the Horse.

It is seldom one gets an opportunity of recording the symptoms of anthrax in the horse, but the following account is due to the fact that the owner concerned had had four animals die from anthrax recently, and therefore any animal ill was expected to die similarly. In this instance it was only too true.

History.—The farm lies on heavy clay loam, is well drained, and comprises sixty-five acres, fourteen cows, two horses, one pig and a number of poultry. In July of last year a cow died after a short illness of only two days' duration, and on the advice of a sanitary inspector (who happened to be at hand when the cow died), the local " knacker " was sent for to dispose of the animal to the best advantage and least expense to the farmer. The carcase was opened on the farm, and apparently some comment was passed on the size of the spleen. Next, in August, a typical case of suspected anthrax occurred in a second cow. This was confirmed by the Ministry of Agriculture, as was the diagnosis of two other sudden deaths of bovines in December last. Thus three typical and one doubtful case of anthrax occurred last year on this one farm. Apparently no other cases of sudden death had occurred during the previous twelve years, but some twenty-eight years ago several bullocks became ill and some died—even while being drenched. (This was believed to be due to " struck," black quarter.)

Subject.—An eight-year-old grey Shire gelding in excellent condition, valued and insured for £40.

August 12th, worked in the cornfields ; heavy day.

August 13th and 14th.—Light work ; animal's appearance and behaviour normal.

August 15th (Sunday).—Usual day's rest.

August 16th.—Ate breakfast normally, but afterwards appeared somewhat tired and heavy, but in the evening he was noticed grazing and resting comfortably. Micturition and defæcation both normal.

August 17th (Tuesday).—6 a.m., normal ; 7 a.m., not quite so well ; 8 a.m., owner worried, so phoned his veterinary practitioner. 9–9.45 a.m., animal carefully watched and allowed to roam around the field adjacent to the farm buildings and stall. During this period he was seen to be uneasy, and noticed " going down and getting up naturally," but about a dozen or more times in less than an hour. Occasionally when down he was seen to bite or nibble the ground erractically. No real signs of " gripes " were evident to the farmer, but the horse was clearly unhappy and not his usual bright self. 9.50 a.m., blood was observed oozing both from the nose and mouth, the latter highly suggestive of his having bitten his tongue. From about this time to his death, some twenty minutes later, the tongue was seen hanging out. A feeble attempt was made to drink water, but soon given up. The eyes were seen to be dull. 10 a.m., veterinary practitioner arrived. Intense muscular spasms were noted, also shaking, staggering and reeling. The temperature at this stage was normal

XUM

—100° F. 10.10 a.m., horse gets down, unable to rise, struggles, groans and dies 10.15 a.m. (approx.).

Diagnosis.—In view both of the previous history of the farm and symptoms shown by the patient, the practitioner had no hesitation in reporting to the police the case as one of suspected anthrax.

Post-mortem features.—(1) Delayed and improper ***rigor mortis*** ; (2) pharyngeal and cervical regions appeared normal ; the associated superficial lymphatic glands were not enlarged, but contained stagnant congested venous blood, somewhat tarry in appearance, with delayed clotting process, and numerous typical bacilli ; (3) hæmorrhage from the nose fairly extensive, none from the anus or penis ; (4) lacrimal secretions hæmorrhagic.

Bacteriological Findings.—The blood and gland smears were suitably stained (following conservative fixation by heat) and demonstrated typical encapsulated anthrax bacilli. Additional slides stained MacFadyean (polychrome methylene blue) showed the characteristic purple detritis surrounding the organisms. Whilst numerous single organisms were demonstrable, short chains were commonest, containing 2–6 bacilli. Longer chains of 10–16 bacilli were also demonstrable encapsulated throughout their length. Blood smears taken from the swab some five hours later showed typical central and subterminal spores. Gaiger and Davies (1932) have noted that the bacillary capsule frequently tends to be one-sided, and this feature was confirmed, but appeared much less likely to be present the longer the chains. Large numbers of polymorphs were seen.

Discussion.—In this case of anthrax there are several points of importance to be considered :

(1) In view of the short period (two hours) during which actual symptoms of specific disease were present, is one justified in terming this a case of peracute anthrax? or, should the uneasiness of the animal on the day previous be considered a premonitory symptom, thus rendering it simply one of *acute anthrax*, and with involvement of the tongue—*Gloss anthrax ?*

(2) The absence of any involvement of the throat and of true colic (except in the very terminal stages) rendered the clinical picture atypical, but the bloody nasal and oral discharges were strongly suggestive of those seen in cattle suffering from typical anthrax. Nevertheless, to the layman (the farmer) the muscular spasms (generally) and the paralysis of the tongue constituted the outstanding features prior to death.

(3) The absence of œdema in the throat and of the associated lymphatic glands examined was conspicuous.

(4) Was the polymorphonuclear leucocytosis seen really indicative of the true blood picture, or merely consequent upon the method of preparation of the smears? (These being made solely with a view to the demonstration of any organisms present, and not for the assessing of the differential leucocytic count.)

(5) In view of the tendency for anthrax to recur on this particular farm,

XUM

it is probable the source of infection lay in contaminated pastures, and not from the ingestion of infected artificial foods such as MacFadyean has suggested occurs in the majority of sporadic cases of anthrax in this country, particularly those seen during the winter months.

(6) The animal was insured for £40, and in view of the insurance policy concerned, a post-mortem examination should officially have been conducted, but under the terms of the Anthrax Order the carcase was, of course, burnt. However, had the Ministry's diagnosis been one of *not* anthrax, what attitude would the insurance company have adopted? If an animal dies of kidney or heart disease, and a practitioner issues a certificate to this effect, presumably this is accepted by the insurance company, and no confirmation is obtained. Similarly, in the above instance, in the opinion of the veterinary surgeon, the case was one of anthrax (suspected), but actual proof and confirmation is, however, available from the higher authorities at Weybridge. Therefore, if the practitioner's diagnosis of heart disease is accepted in the one case (without confirmation), is it to be disputed in that of suspected anthrax?

Note.—It may not generally be realised that several insurance firms prepare special anthrax policies at very low rates (approximately 3*s.* per cent., with 1*s.* added for each case of the disease which has occurred on the farm), and that this may, therefore, be the best prophylactic available to the farmer. Nevertheless, there will presumably be certain "anthrax" farms which insurance companies will refuse to accept for risk, and in such instances vaccination will be required. Since all live vaccines are liable to produce approximately ½–1 per cent. mortalities, an aggressin may possibly be recommended. Following the establishment of the artificial immunity created thereby in his stock, the farmer will then presumably be able to use his "infected" pastures freely, which cannot be recommended if reliance is placed solely on an anthrax insurance policy.

Variola Vaccinia.

References to this disease in current literature are few and far between, but the writer encountered three interesting outbreaks recently.

Case 1.—A farm labourer developed on his hand, following a local injury, a lesion suggestive of cow-pox. Later this became septic, and was subsequently diagnosed by his doctors as impetigo (superimposed on vaccinia) and cellulitis respectively. An examination of the herd concerned showed lesions closely allied to, though separate from, those of typical cox-pox, and the term para-vaccinia is therefore suggested as applicable. False cox-pox, or varicella, has been described by Gamgee and also by Wooldridge (1923), but the symptoms are not those to be described, neither is this nomenclature to be considered satisfactory, because varicella should refer specifically to chicken-pox of man, and be restricted to that use. It will be remembered in true and typical cox-pox the lesions pass through the following stages: papule, vesicle, pustule and scab. As a fact, the formation of pustules is not a necessity, but because secondary infections are

extremely common, pustules do form. Nevertheless, because of the manipulation of the vesicles which occurs during milking, many vesicles burst before pustules can form, and as a result the scab stage is reached earlier than expected.

In the outbreak under description, pustules were scarce, and the papules were not typical and shot-like, but in their place, bright-pink macules, diameter one-eighth to three-eighths, were numerous. The lesions were localised to the teats and adjacent basal portions of the udder, and the vesicles were rarely more than one-third inch in diameter, and usually discrete. It could not be said that the teat lesions were oval and those of the udder circular, as the text-books suggest, nevertheless, all stages of the usual pock eruption were visible on an examination of several cows, *viz.*, macule, papule, vesicle, pustule, scab and scar.

Friedberg and Frohner (1908) describe in their " Special Pathology " a condition " Vaccinia verrucosa," characterised by wart-like growths on the teats. This feature was also well marked, and if there is any direct relationship between such wart formation and vaccinia, then it is clear that the case under discussion was probably atypical cox-pox, but associated with a virus of low and altered virulence.

Following milking, scab formation and desquamation tended to be unduly prolonged and required to be differentiated from teat injuries due to suckling by calves, which were a complicating factor. The latter were frequently crescentic in outline (conforming to teeth marks) and always appeared as scabs—never vesicles or pustules—nor did they occur other than on the teats, whereas all stages of the vaccinia eruption were observed (unspoilt) at the base of the udder between the teats.

Case 2.—Again, following the notification of cow-pox in a farm worker, the writer was requested to examine a herd of dairy cattle exhibiting " teat sores." On this occasion the lesions were typical in every way. Macules were less common ; square, pale, shot-like papules were numerous (particularly on the teats) and apparently were thicker walled. Numerous vesicles formed, and in the majority of instances remained discrete. Pustules were present, and the resultant scabs tended to confluesce and form raised sores ; occasionally some were ulcer-like and depressed, which, in the absence of specific treatment, remained indolent and healed slowly. The general health remained good.

To prove the pathogenicity of the virus, material was sent away for rabbit inoculation purposes ; but first the writer decided to inoculate himself on the forearm. No vaccination against smallpox having taken place for twenty years, the writer believed himself suitable for the operation, and, following fairly heavy scarification, rubbed in the swab which was to be sent away for vivisection purposes. The result, contrasted with the symptoms of normal vaccination (as described by Letheby Tidy), may be of interest :

Constitutional Symptoms.—Variable malaise ; pyrexia third to eighth day, with eruption ; axillary glands palpable.

Normal Vaccination.—Third day, papule with red zone ; sixth day, vesicle

with umbilication; eighth day, vesicle with maximum distension; tenth day, pustule, skin swollen and painful; twelfth day, pustule commences to dry, hyperæmia diminishes; twenty-first day, scab separates.

Variola vaccinia Inoculation.—First day, scarification and inunction (forearm); second day, erythema, some fever at night; third day, formation of vesicles, axillary glands palpable, slight pain; fourth day, vesicles enlarge and irritable, glands quite painful; fifth day, vesicles umbilicate, glands painful, marked malaise; sixth day, area of erythema enlarges, scab formation commences; seventh day, scarification marks healed, axillary glands less painful, scab formation complete; eighth day, scabs drying up nicely; ninth day, glands scarcely noticeable; tenth day, scab commences to peel at periphery, no glands; eleventh day, erythema diminishing, hæmorrhagic oozing from beneath the scabs; twelfth day, deep ulcers evident below the scabs, oozing freely; thirteenth day, raw ulcers with necrotic pale-white centres, scabs gone; twentieth day, ulcers healing nicely; twenty-eighth day, superficial scabs reformed; thirty-fifth day, ulcers healed, marked erythematous area around each.

Although this proved the lesions on the cows' teats and udder to be those of true cow-pox, it is interesting to note that the same swab used on rabbits failed to induce pox lesions until after fourteen days had elapsed from the time of inoculation, yet the rabbit is considered a ready host for the vaccinia virus.

Case 3.—Notification to the effect that milk from a given farm contained numerous streptococci, some staphylococci, and pus cells; an examination of the herd showed widespread lesions typical of mild cow-pox. In this instance macules and papules (rather firm and wart-like in consistency) were evenly distributed, small vesicles (rarely over one-third-inch in diameter) were common, pustules were scarce, and scabs (rather light in character) observable in fully 50 per cent. of the whole herd of twenty-five animals.

The teat "sores" were usually not painful, and although lesions were present on a dozen or more cattle, the owner and cowmen were unaware of the existence of any such specific malady. Samples of milk from typically affected cattle showed lowered specific gravity 1026 (mixed sample from four cows), 1024 (single sample). Normal variations between 1028–1031.

The cloth used to wipe the udders before milking was never boiled, plain tap-water being used for washing purposes, and there is no doubt this would also aid in the mechanical spread of infection from cow to cow.

Tuberculosis.

False Tuberculin Reactions.—Cows full of tuberculosis which fail to react to injections of tuberculin are well known, but less appears to be understood concerning the fairly typical reactions which may occur in certain animals apparently free of bovine tuberculosis. A review of the available data concerning these false reactions suggests that they may be due to: (1) Tuberculins containing their full quota of proteins, non-synthetic types; (2) early incipient Jöhnes dis-

XUM

ease ; (3) small cutaneous nodular or lymphatic lesions (due to the avian or other acid-fast bacillus) not disclosed by ordinary post-mortem examinations.

During the past few weeks the writer has been sufficiently unfortunate to meet a number of cases of the above, as follows :

(1) Ten of forty-two Guernsey cows having reacted to Pasteur's tuberculin injected intradermally, nine of these were retested with synthetic bovine tuberculin and Johnin, and all passed the test. The tenth cow was killed and examined carefully post-mortem, and no signs of tuberculosis were found. All suspicious lymphatic glands were tested biologically and parts of the small intestines examined for acid-fast bacilli, but none was found, nor were there clinical lesions indicative of Jöhnes disease. Presumably, therefore, the initial reactions were due to the protein content of the tuberculin and not in any way related to tuberculosis.

(2) Having had no reactors in a previous test applied four months previously to a herd of 160 cattle, it was somewhat surprising to find seven fairly typical reactors. The tuberculin used was synthetic (Cambridge-London), and therefore the question of a false (protein) reaction could not occur. The oldest of the seven cows was killed and found to be suffering from localised patches of enteritis (small intestines) from which one acid-fast bacillus was obtained. Histologically, there were no characteristic Jöhnes disease changes found, although the part actually examined was different from that where the organism was recorded. No lymph glands were found affected by tubercles, and those with any suspicious lesions were tested biologically, but without any positive result. In view of the inflamed appearance of the lining mucosa, it was concluded the bacillus found was probably that of Jöhnes disease, and that the tuberculin reaction was a response to early Jöhnes infection. The six remaining cattle were re-tested with another batch of synthetic tuberculin, and three passed ; but three still showed a reaction which could not be considered normal or negative. The resultant swellings were non-œdematous, localised, flat, nodular, relatively painless, but large, *e.g.* :

Initial.	48 hours.	72 hours.
5 mm.	8	11
8 mm.	13	15
7 mm.	11	13

These animals are still in isolation and will be re-tested with both synthetic tuberculin (another batch) and Johnin. No clinical case of Jöhnes disease having occurred on this farm for at least four years, it was not expected to find this as an interfering factor in the elimination of tuberculin reactors.

(3) While testing another herd with the same batch of synthetic tuberculin, as described in the initial test under (2), two animals in this new herd also gave false (large, firm) reactions (painless). No cases of Jöhne's disease have appeared on this farm recently. It remains to be decided therefore whether these pseudo-tubercular tuberculin reactions are due to faulty technique, a less specific batch

XUM

of synthetic tuberculin, incipient Jöhne's disease, "skin nodules," or what. The one point which does appear certain is that the tuberculin test is not quite as specific and reliable as one had fondly imagined.

Primary Tuberculosis of the Udder.

Whilst the majority of cases of udder tuberculosis appear secondary to tuberculous lesions of the peritoneum, one occasionally meets a well-established lesion in the udder with little or no involvement of other internal organs. In a recent case two unusual features were of importance: (1) pain, (2) pus in the milk. Manipulation of the affected quarter evinced marked pain, and the secretion was purulent, sticky and tenacious, thus contrasting with the usual findings in a typical tubercular udder. The heifer in question had been known to be affected with "garget" for three weeks (her calf had been found affected with tuberculosis on slaughter), and her milk proved tuberculous on guinea-pig inoculation. The pain and pus were evidently due to a coincidental pyogenic infection, for such was found at post-mortem, and the only other tubercular lesions were small tubercles in the mesenteric and bronchial lymphatic glands. Possibly an accidental inoculation of the quarter by a stake or other foreign body accounted both for the pyogenic and tubercular infection encountered.

Enlargement of the Supramammary Lymphatic Glands.

Those who examine the udders of cows clinically know how frequently it is possible to detect an enlargement of the lymphatic glands concerned. Yet such palpable enlargement is only infrequently associated with tubercular infection; indeed, in the absence of udder induration, experience suggests that the cause is streptococcal (sometimes staphylococcal) in origin. The larger the gland, frequently the more normal the feel of the udder and the less chance there is of its being infected with tubercle bacilli, the milk usually appearing unchanged, but excreting large numbers of pyogenic organisms, discernible microscopically. When clinically enlarged supramammary lymphatic glands are an accompaniment of tubercular mammitis, diagnostic changes in the udder tissue would seem to be nearly always well marked.

Tuberculin Testing Sows.

With an extension of the Attested Herds Scheme there is little doubt the testing of pigs will become more essential. Sows are usually tested in the loose fold behind the ear, but this is not necessarily satisfactory. In old dirty sows there may be little skin that is loose and suitable for the injection of tuberculin, and, further, it may be very difficult to assess the resultant swelling. The writer suggests that the skin forming the lips of the vulva is more suitable and practical. Sensory nerve endings there do not appear to be over-numerous, the vulva is easily reached (more especially if the sows are penned in a corner or given food in trough) both for injection and inspection purposes. The greatest asset, however, is its apparent extreme sensitiveness to tuberculin, which should be injected just to the side of the vulva (labia majores), 1/10 c.c., one to two millimetres deep, bovine

tuberculin into one side and avian the other. The result may be read in twenty-four *or* forty-eight hours, for the reaction is typical and persists, developing within twenty-four hours of the injection. In doubtful cases, which are few, a second injection may be given and the test read again the following day. In a reactor a tense, warm, relatively firm swelling of the part occurs ; the œdema is particularly well marked, and may easily cause an obvious distortion of the vulva, pushing its orifice over towards the opposite side of the median line. In addition, a bluish, stagnant state of the surface capillaries sometimes gives an appearance of bruising. Opportunity has been taken to check the above swellings as significant of tuberculosis by post-mortem examination, and although the series has been small, so far the diagnostic significance of the reaction has always been confirmed. In negative cases the vulva remains normal and no swelling is apparent. It is, therefore, unnecessary to actually handle the parts, reactors showing themselves clear to the eye itself. Out of thirty sows tested, thirty-four per cent. have reacted, the post-mortem examinations carried out revealing lesions in the pharyngeal, bronchial and mesenteric lymphatic glands.

Undulant Fever

Although the medical profession readily recognise at least two Brucella organisms as causing undulant fever in man, the actual relationship between *Br. abortus* and the disease is not clearly understood. Medical officers of health readily assume that all milk from cattle which have aborted (due to specific Bang infection) will cause the disease in people who drink it raw ; but the available statistics suggest that such cannot be true, otherwise undulant fever would be widespread and epidemic. The high incidence of contagious abortion in dairy cattle, with the concomitant contamination of bulk milk, contrasted with the few cases of " Malta fever " in man noted annually, makes the pathogenesis of the disease difficult to understand when viewed from a veterinary standpoint. Nor can this apparent discrepancy be explained on the grounds of differing susceptibility on the part of those who drink infected milk, or variations in the virulence of *Br. abortus*. It would appear either that our medical *confrères* do not diagnose the malady sufficiently frequently, or that an uncomplicated *Br. abortus* infection is rare.

While the former may perhaps in part be true, it would seem far more reasonable to believe that a second causal factor (complimentary to the bacillus) is a necessity. It is to be hoped that the researches of Dalrymple-Champneys and others interested in this problem will proceed with vigour until the full ætiological story is known. In the meantime, the veterinarian familiar with accepted facts regarding the probable degree of infection of raw milk can do much good by discussing the problem with members of the medical profession when occasions arise, thus altering their present somewhat prejudiced outlook on the undulant fever and, incidentally, the pasteurisation problems.

Under present legislation regarding the sale of foods it is implied that all milk sold to the public shall be fit for human consumption purposes. In civil law

apparently " no reasonable precautions " are to be expected, for the milk, if sold, *must* be fit, and therefore free from disease-producing organisms, otherwise action can be taken. If this is true, then all purveyors of milk contaminated with tubercle abortus, or other pathogenic bacilli are liable to prosecution, should disease arise from the drinking of such milk: this despite any precautions which may have been taken to ensure its apparent safety. While this may be the strictly legal viewpoint, it is interesting to speculate whether " human consumption " implies drinking by normal people, or may it also include " susceptible " persons ?

CHLORAL HYDRATE ANÆSTHESIA BY INTRAVENOUS INJECTION IN HORSES AND CATTLE.

By RICHARD HUDSON, F.R.C.V.S.

Retford.

I HAVE been using chloral hydrate intravenously for a considerable time, long enough to say how it behaves, and to compare it with chloroform. Chloroform is very satisfactory even for prolonged operations if one has a trustworthy administrator, but if not, there is always the worry of something serious happening. Also the operator may have to leave off and assist in its administration, perhaps at a critical time, which is a great drawback. For operations on the mouth, where chloroform anæsthesia can only be temporary, operations on the foot, and in other parts, the anæsthesia produced by chloral hydrate is as satisfactory as any other—often more so.

Dosage.—It is not easy to fix a definite dose for any animal, owing to variation in susceptibility, nor is it necessary, because one can continue administration until its effects are produced. I commenced by using one and a-half ounces in twenty-four ounces of water, but as this sometimes only just brought the patients (heavy shires) down, I increased the quantity to two ounces in twenty-four ounces. With this I always have some in reserve, though it has not been called on in any case yet. Susceptibility does not appear to vary much. A big strong horse in good condition is the most resistant, as one would expect. The injection is prepared by dissolving two ounces of chloral hydrate in water which has been boiled and allowed to cool a little. It is then filtered through cotton wool, and the quantity made up to twenty-four ounces.

Apparatus.—A whiskey bottle (twenty four ounces), rubber cork bored with two holes, rubber tube two and a-half feet long (which passes through the cork to the bottom of the bottle, and the other end has a mount to fit the needle), rubber bulb and about six inches of tube (the tube passes through the other hole in the cork, but not into the solution), and needle two and a-half inches long and one-sixteenth of an inch thick. The tubing is one-quarter of an inch thick, and being so arranged has no joints or projections, and is very flexible.

XUM

Administration.—The patient is fasted over night if possible, brought out on to a suitable bed. A covered yard or barn is best because he may have to lie some time before he gets up, but if he has to lie in the open he can be covered.

A twitch is applied, and, if they are likely to be needed, side lines may be placed on the neck, and the side ropes coiled and tied with twine to the neck rope, ready for use. The hair is shaved over an area of about one inch, touched with iodine, and the needle inserted into the raised jugular vein. Having connected up the apparatus, pumping is carried out slowly at first, until some air is present in the bottle, then faster, allowing a rate of five minutes to empty the bottle.

Administration is carried on until the patient becomes unsteady, then slowed a little until he looks like falling. The tube is then pinched and the needle withdrawn, or the cork may be pulled out of the bottle before withdrawing. I have not had a patient show excitement. Sometimes they may rock and resist going down, but a lead on or a steady pull round usually puts them down. When down they do not struggle to rise again, and in two or three minutes are ready for operating on. Usually I tie all four legs together as a safeguard, and if for an abdominal operation, put on side lines.

Duration of Anæsthesia.—The shortest period has been about one hour, but he might have been longer if left undisturbed. The longest has been about four hours, or five if the time of operating is counted. Sometime they have needed a lift at the tail when they have been restless and the owner may have wanted them up ; at other times they have been left, risen on their own, and been quite steady on their legs when found. One mare found her way to the kitchen instead of the stable. If in a yard or enclosure, it is not necessary to leave an attendant, but if in an open field it would be, to prevent accidents. Patients should be kept warm until they become conscious, and for several hours after they should be rugged.

I do not think the anæsthesia is as deep as that produced by chloroform. I have noticed that when driving out a fast molar, a succession of blows on the punch tends to wake them up, but not to the stage of struggling or resistance.

Remarks.

The fact that they lie longer may sometimes be a disadvantage, but in the cases selected it did not matter

Phlebitis.—I have not seen any ill-effects in the jugular region, perhaps because my solution has been dilute. I have not had any excitement during injection, nor while recovering from it. I have not had heart shocks, nor symptoms of distress during injection, and the solution has been injected cold. The same injection has been used on yearling cattle, two-year-old horses, and horses up to about sixteen years old. The young animals did not take as large a quantity, but the solution was the same strength.

All my administrations have been performed with the animal standing, and there has been ample time to avoid accidents. They do not seem to be inclined

XUM

to wander, and mostly lie down naturally, or are easily steadied down. All my cases are still alive but one, which was destroyed after several weeks. He was worn out, having lost several molars.

Degeneration of the liver has been mentioned as a sequela to the administration of chloral hydrate, but I have not found it. I have often given two ounces of chloral hydrate in powder packet balls and by stomach tube without noticing much hypnotic action. I have given it as an enema also without marked effect, so one must consider these methods unsatisfactory for producing operation anæsthesia.

It has often been condemned in this country, but on the Continent it has been used extensively for many years.

Abstracts of Current Literature

The Artificial Insemination of the Cow. By Professor Dr. KUST, of Giessen. *Berliner Tierarzt Woch.*, No. 50.

BY " artificial insemination " we understand the transference of the semen obtained from the male animal into the genital organs of the female with the object of securing her pregnancy, in the absence of the normal necessary covering or coital act. The history of artificial insemination in our domestic animals goes back to the fourteenth century. At the conclusion of the Great War the method was extensively adopted in Russia, and in that country several millions of animals of different breeds are inseminated annually. The object in view was to increase stock breeding which had declined, and to make use of good male stock to the best advantage because at that time a great lack of the latter existed. According to reports, the success of the method appears to be very good.

In our work we have relied upon the experiences of Gotze in Russia in obtaining semen, in the treatment of the semen, and its transference. At my institute during the last three years, and in various districts, we have inseminated several hundred cows and heifers with the object of combating contagious genital diseases, such as trichomonad infections and vesicular and nodular vaginitis. Artificial insemination can only be successful if the sperm is obtained in sufficient quantity and of good quality. The ejaculate must be obtained in a simple and suitable way without injury to the donor. It must be completely pure. The quality of the sperm may be fundamentally influenced by impurities. The number of spermatozoa to the cubic unit must correspond to the physiological proportions, and their vitality and motility must be completely retained.

A number of methods for obtaining semen from our domestic animals have been described in the literature on the subject. According to our observations the method of Götze, in bulls, in which he makes use of the artificial vagina, have proved the best. This consists of a double-walled rubber tube 60 centimetres

FIG. 1.—Obtaining semen from bulls with the artificial vagina in the hand.

XUM

FIG. 1.—Obtaining semen from bulls with the artificial vagina in the hand.

(*a*) Bull mounting, and introduction of penis into vagina.

(*b*) Disconnecting the bull.

FIG. 2.—Semen from the bull by the artificial vagina in the phantom.

(*a*) Mounting of the bull.

(*b*) Disconnection of the bull.

(*Abstract of article by* Professor Dr. Kust, *page* 454)

long and seven centimetres diameter, whose outer wall is fixed and stiff, and whose inner tube consists of soft rubber of the finest quality. The internal cavity of the double tube is filled before use with water at a temperature of 40° C., this serves to make the outer opening elastic, and to narrow the opening around the introduced penis of the bull, and to furnish the necessary resistance for ejaculation. It also provides a natural body heat similar to that in the vagina of a cow. In an opening of the tube a semen object glass is introduced, and fixed with a special holding device. The closed end of the glass is reduced in size and is graduated in order that the semen obtained may be estimated in cubic centimetres. It is important that the glass vessel be firmly fixed in the indiarubber tube, since overlooking of this matter may easily occur, and that with the powerful thrusts of the bull it may easily be jerked out and the semen be lost. The opening of the free end of the vagina serves to take up the penis after it has been freely rubbed over with white vaseline. It is important also that the cavity between internal and external wall contains a sufficient quantity of water so that the sire in the covering act finds a suitably strong resistance. The water must be kept at the required temperature because at a lower temperature many bulls do not cover, or cover badly, and thereby the obtaining of good sperm in sufficient quantity is questionable.

In order to increase the desire of the bull, a pulsator is interposed, the soft inner wall of which performs surging movements. The pulsator consists of an indiarubber ball which is joined by a narrow tube to the water-filled bag. Through pressure on the ball, the water performs wave-like movements. In the phantom method the artificial vagina is fixed in the phantom by a special device and is as willingly and well served by most bulls as that of a natural cow. Often several jumps are necessary to secure suitable semen in sufficient quantities, and some individual bulls refuse the phantom. This is chiefly the case with young bulls which have not yet been used, or if the attention of the bull is diverted by cows or any noise. It is recommended that the phantom be placed on soft earth so that in the jump no avoidable slipping or noise occurs; and cows in œstrum, strangers, in short, all that distracts the bull is excluded from sight and hearing. Massage of the rectum was occasionally used to obtain semen, but it must not be persisted in—it takes up much time and the semen is liable to be contaminated with urine or blood. In order to avoid soiling of the seminal fluid the prepuce and its hair are previously thoroughly cleansed with physiological salt solution. Comparative examinations have shown that semen obtained by the artificial vagina is qualitatively first class, and this method of obtaining it for artificial insemination is specially recommended. The obtaining of the sperm by the artificial vagina is the best, safest and most appropriate method in order to obtain a reliable semen in sufficient quantity. It takes proportionately little time, and with a little practice can easily be mastered. The amount of sperm obtained from bulls is individually very varied, and deviates between 0.5 and 14 ccm.

The colour of a good bull's sperm should be pure white; suspended spermatozoa

XUM

may be seen in the seminal fluid ; it may be changed to greyish-yellow, or reddish, through entrance into it of urine, blood, or other substances.

The PH value is important in the judgment of a good useful semen. The PH value of the normal sperm of a healthy bull is below neutral point, also in acid state, and for artificial insemination it is only possible to employ semen whose PH value lies between 6.4 and 6.6. Alkalinity is a certain sign of considerable impurity. It especially denotes soiling with urine. It has also been shown that in alkaline semen the concentration and motivity of the spermatozoa declines, and this certainly hinders conception.

Direct sunlight is very injurious to the vitality of the sperm. High and low temperatures are injurious. The best optimum temperature lies between 10–25° C., and for a long period, 5–13° C.

For the preparation of instruments the following physiological solutions are recommended : 1,000.0 distilled water, 9.0 chemically-pure salt, 0.5 sodium bicarbonate ; or 1,000.0 aqua dist. ; 60.0 refined sugar, 0.9 chemically-pure salt, 0.5 sod. bicarb. The sodium bicarbonate is first boiled, filtered, and allowed to cool. For the dilution of sperm, physiological salt solution has been quite good in our cases.

The preservation of semen is maintained in a concentrated state at a cold limit of temperature of + 4 to 8° C. The necessary dilution for insemination is always done shortly before use.

The practical performance of artificial insemination, after some experience and practice, presents no difficulties, after one obtains a pure semen in sufficient quantity. For the last three years in Giessen we have performed artificial insemination on several hundred animals, where coital infections have been prevalent, with the best results, and to the great satisfaction of the owners. We have obtained the semen almost exclusively on the spot by the help of the artificial vagina. Only exceptionally was the phantom used. The sperm obtained is examined macroscopically and microscopically for amount, colour, consistency, and foreign mixtures, and for the size and motility of the spermatozoa. The spermatozoa must be active and mobile for successful insemination. Metal instruments must not be used, but only those of glass or indiarubber. The catheter may be inserted into the *orificum externum* by the hand, or it may be held firm by Albrechtsens forceps, and a vaginal dilator and torch used to see the entrance into the uterus. About 1 to 2 ccm. of fluid is injected into the uterus.

Out of 490 animals artificially inseminated, and in three districts where trichomonad infections existed, 387 became pregnant. It was shown that insemination was most successful at the height of the œstrum because at this time a ripe, fertile ovum is present.

The weight of newly-born calves from artificial insemination was 36 to 53 kilograms, and their development afterwards was quite good.

XUM

Instruments, etc., Used.

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On Weil's Disease in Dogs and Foxes. By SVEN RUBARTH. *Skandinavisk V. Tdschrft.*, June, 1937.

THE author is giving a general orientation of Weil's disease in dogs and foxes, and describes the pursuance of this his material (eight dogs, eleven silver foxes and one blue fox). The disease, which in Sweden seems mostly to occur sporadically, has, in the author's opinion, on some occasions both in dogs and foxes, assumed an enzootic character. On a fox farm with something like thirty animals approximately half the number fell ill in the course of a few days with *morbus Weili*. The diagnosis has in all cases not been made until sectioning took place, and spirochætes were proved to be present by means of Levaditi's silver impregnation method (original), and in some cases by means of guinea-pig inoculation. In dogs the author's material includes Weil cases, both with and without icterus, and of the last-mentioned type there occur examples of both a peracute hæmorrhagic type and a uræmic one (so-called Stuttgarter Hundeseuche). The clinical symptoms do not differ from statements occurring in the literature. In nearly all cases there was demonstrated in the sectioning in the liver a distinct dissociation of parenchymatous cells, together with signs of serious hepatite. In no cases could a sign of an obstruction of bile-canals be observed. In two cases the sectioning disclosed in the ductus cysticus a mucous lump together with an empty collapsed gall-bladder. In the non-icteroid uræmic type there existed, both clinically and pathologic-anatomically, the picture which occurs in the so-called Stuttgarter Hundeseuche, and in the kidneys were demonstrated plentiful spirochætes, which lay in large quantities inside tubules and in the interstice.

Occurrence of Flagellates in Abortion in Cattle.—A Preliminary Communication. By M. KOFFMAN, Fil. D., Stockholm. *Skandinavisk V. Tdschrft.*, 1937.

FLAGELLATES have been found in samples taken from cows which had aborted, and form found is described. It appears to belong to the genus *Bodo*, and constitutes a species not observed previously in cattle. The name proposed is *Bodo fœtus*. The parasite, which is found in the secundines, can be kept for some length of time at a temperature of 6–7° C., without its power of development being affected unfavourably. The best and simplest medium for the cultivation of this parasite is a physiological saline solution, to which has been added a little secundine tissue. On cultivation at room temperature (about 20° C.), it develops

very richly on this medium after no more than a couple of days. The optimal PH value for the development of this flagellate is about 7.0. At PH values below 6.5 and above 7.5, the development of the parasite is attested. A simple method is described for making smear preparations on slides of these flagellates.

REPORT OF THE VETERINARY DIRECTOR-GENERAL FOR CANADA FOR THE YEAR ENDING MARCH 31st, 1937.

DR. HILTON has issued his always interesting annual report for the year ending March, 1937. It embodies his own *résumé* of the work carried on in the Contagious Diseases Division, Meat and Canned Food Division, Pathological and Research Divisions. Anthrax is not a prevalent disease in Canada, only one outbreak occurred. Dourine has not been observed during the last seventeen years. One case of glanders was dealt with and two cases of hog cholera (swine fever). Mange was observed in seven horses, and a few outbreaks occurred in cattle. Rabies and sheep scab have not been observed for a few years.

Tuberculosis.—Under the Supervised Herd Plan, 43,465 herds were tested, and 2,647 herds are awaiting tests.

Restricted Areas for Eradication.—In these, all cattle are tested with tuberculin, reactors slaughtered and compensation paid; 690,037 animals were tested, 31,223 reacted and slaughtered, and 921,468 dollars paid in compensation.

Bang's Disease.—Assistance is given to stock owners by conducting blood tests in order that infected animals may be segregated or slaughtered. Applications for tests increased, there being now 1,650 herds under supervision, comprising 42,900 cattle.

Swine Fever.—To prevent outbreaks, feeding of swill garbage, meat scraps, offal or vegetable is prohibited without license.

Cattle Exportation to Great Britain.—All cattle for export are isolated and inspected for twenty-four hours prior to shipment, and tagged in the right ear with the letter "C" and serial number. In addition, cattle intended for breeding or milk production are tested for tuberculosis and Bang's disease. Total numbers shipped 35,694.

Inspection of Cars and Sale Yards.—Eighty-three thousand nine hundred and eighty-seven cars and 11,419 trucks were inspected and disinfected, also all stockyards.

Importation of Animals.—All animals imported must be accompanied by one official veterinary certificate of the exporting country as to freedom from contagious disease, that no contagious disease has existed in the district of origin for six months prior to shipment, and they will not be freed from quarantine until blood tested for Bang's disease. If they react they will be permanently marked,

XUM

slaughtered or returned to the country of origin; animals from Scotland or Ireland conveyed in a ship not touching an English or foreign port must be accompanied by a certificate to that effect, and that they have been in the countries mentioned for a period of sixty days prior to shipment. Animals passing through the quarantine station in London will be admitted by "permit."

Meat and Canned Foods.—Animals slaughtered under Government veterinary supervision: Cattle, 1,546,548; Sheep, 829,498; swine, 3,821,602; poultry, 765,275; buffalo, 1,522; goats, 22. Bovine carcases rejected, 1.65 per cent.; ovine carcases rejected, 0.35 per cent.; swine, 0.27 per cent.; swine rejected for tuberculosis, 40.39 per cent.; swine portions rejected for tuberculosis alone, 76.15.

Government veterinary inspection of animals providing meat for human consumption has existed for thirty years.

PATHOLOGICAL DIVISION.

Species.	*Specimens examined.*
Horses and mules	351
Cattle (other than Bang's disease)	554
Cattle (for Bang's disease)	72,152
Sheep	27
Swine	110
Poultry (other than for Pullorum disease)	712
Poultry (for Pullorum disease)	234,807
Foxes and fur-bearing animals	113
Wild animals and birds	2
Dogs	21
Cats	1
Goats	4
Guinea-pigs	1
Meat and canned foods	139
Miscellaneous	16
Human (*Br. abortus* and Glanders)	39

Altogether an interesting and educative report.

Reviews

The Dissection and Study of the Sheep's Brain. By JAMES WILKIE, B.Sc., Department of Biology, Guy's Hospital Medical School. London: Oxford University Press (Humphrey Milford), 1937. Pp. 92. Figs. 53. Price 6*s*.

THIS is one of the Oxford Medical Publications. It has a foreword by Professor T. B. Johnston, of Guy's Hospital Medical School. There never was a time when more people were suffering from nervous strain and tension than in this age, and anything

that can help in the study of the nervous system, as this book does, must be blessed and commended. In the foreword, Professor Johnston states : " The average student finds the structure of the human brain more difficult to grasp than that of lower forms, partly at least owing to the changes that have occurred in the rhinencephalon during the process of evolution. The study of the brain of a macrosinatic mammal such as the sheep, side by side with the human brain, should remove many of the difficulties which the student experiences, and repeated references to the functions of the areas under consideration should arouse and stimulate his interest." The book consists of five chapters and an excellent index. It describes : (1) How to get the brain out ; (2) the general anatomy of the brain ; (3) general study and first dissection ; (4) second dissection ; (5) hand sections of the brain. The many well-drawn figures in the text are very gratifying and help materially in its elucidation. The comparison between the sheep's cerebellum at page 59 and the human cerebellum at page 62 is especially interesting. There seems to be a fair amount of grey matter in the sheep's brain which does not, however, function as in the human brain. The author has produced a pioneer work on the sheep's brain useful alike to the student of human and veterinary comparative anatomy. In his preface he states : " There are some who might wish to get some knowledge of the human brain, but cannot easily come by a specimen for dissection " ; and to such this book will be a very present help.

" Taglioni's Grandson." By PETER SHIRAEFF. London : Putnam & Co., Ltd. Price 7*s.* 6*d.*

SOVIET Russia lost not only a great writer, but a great lover of horses, when Peter Shiraeff died of tuberculosis in 1935, at the early age of forty-nine, just when he appeared to have reached the maturity of his literary powers. Apparently in his native country " Taglioni's Grandson " was considered his masterpiece, but since it is the only one of his works to be translated into English, it is hard to tell how correct this is, but in any case it is certainly well written, and written in such a way that it is hard to leave the book, although the subject—trotting horses in the main—may seem a very limited subject on which to write a novel. The story begins with Russia at war in 1915, with the hero, a jockey trainer, training what he thinks to be the greatest trotter of all time. His ambition looks like being fulfilled when the Revolution intervenes. His dream ultimately comes true, not through the mare, but through her son, who coincidence throws in his path. The final triumph of this colt " Taglioni's Grandson," finishes the book. Perhaps it could be said that this was not much of a background for a book, but the genius of Shiraeff has made of it a vital book which shows the types of people before and after the Revolution, and how horse-racing fares after 1917. Perhaps one of the author's best character studies is that of Alexander Egovitch, the veterinarian, who discovers a peasant using " Taglioni's Grandson " pulling the plough, and his advice to the peasant eventually brings the mare back to health, which had been seriously affected by the trials of the Revolution. He then advises the peasant not to make a plough-horse out of her son, but to take him to Moscow to be trained as a trotter, where the original trainer of the mare comes across " Taglioni's Grandson." This is a book well worth reading.

XUM

News

INTERESTING TRADE DEVELOPMENT.

The well-known " Bayer " firm, Pharmaceutical Department of the German Dye Trust (original inventors of aspirin), now possess their own private aeroplane for the distribution of medicines to their various depots in Europe and elsewhere. This is probably the first instance of a commercial firm employing its own air service for the distribution of its goods. The advantages of air delivery for medicinal chemicals is obvious, and this service will be particularly beneficial in the case of epidemics such as arise from time to time in near eastern countries. In such cases suitable remedies can be sent by this fast aeroplane, and the considerable time thus gained may be the means of saving many lives through suitable treatment being available at a much earlier stage than would otherwise be possible. In the case of the present maiden flight to London, fortunately no such emergency existed, but the experience gained will enable the pilot to become familiar with the landing arrangements at Croydon and other regulations in regard to air freight. The machine this time brought over supplies of Bayer aspirin and other pharmaceutical products, including their most recent discovery, Prontosil, the drug which marks a new epoch in the treatment of streptococcal infections. The aeroplane, which has accommodation for passengers, has ample room for drug supplies, and as the journey from Cologne to London can be done in approximately two hours, there is a considerable saving in time in goods reaching London. This rapid method of transport is a forward step in modern business development, and there is no doubt that in time to come it will largely supersede the slower rail and steamship services.

DISEASED CATTLE CARCASES.—LANARKSHIRE COUNCIL'S DECISION.

Tubercular Animal Flesh to be Destroyed.

All carcases of cattle found by Lanarkshire public health authorities to be suffering from tuberculosis are to be destroyed. At a meeting of the Lanark County Council held recently that decision was come to after some discussion. The matter was raised by a motion submitted by Mr. Robert M'Cracken at a meeting of the Diseases of Animals Committee, held on November 12th. The motion was as follows :

" That this committee recommend to the County Council that, having regard to the possibility of the transmission of tuberculosis to human beings by the consumption of the flesh of animals slaughtered under the Tuberculosis Order, 1925, and passed by the Public Health authorities as sound, the sale of such flesh should cease on the termination of the present contract, and that in future the whole carcase of any animal slaughtered under the Tuberculosis Order, and found to have suffered from tuberculosis, should be destroyed."—*Glasgow Herald.*

THE CENTRAL LIBRARY FOR ANIMAL DISEASES.

As is well known to our readers, this library is situated at the R.C.V.S. house in Red Lion Square, W.C.1. It replaced the old library, for it was felt that the usefulness of that institution could be greatly extended with benefit to the veterinary and allied

XUM

sciences. In the short time of its existence the central library has fully justified its founders' expectations. Its work is growing in importance and in quantity. To obtain the maximum service from any library a catalogue is necessary. We would direct our readers' attention to the catalogue of the Central Library issued by the Royal College of Veterinary Surgeons, which gives a full list of text-books published since 1900. There is also an appendix showing the list of periodicals received in the library. If suggestions are not out of place we would suggest that the conditions under which the library may be used might well find a place in this handy booklet. The catalogue is published by the Royal College of Veterinary Surgeons at the price of one shilling.

Publishers' Notices

All communications should be addressed to 7 & 8, Henrietta Street, Covent Garden, London, W.C. 2. Telephone: Temple Bar 8568. Telegrams: "Baillière Phone, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Copy of advertisements should be in the hands of the publishers — Baillière, Tindall and Cox — not later than the 25th of the month, or if proof is required, not later than the 23rd.

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INDEX TO ADVERTISERS

CHEMISTS. PAGE

ALLEN & HANBURY'S LTD.—Plough Brand Cod Liver Oil, Tubercle Vaccine R - xvi, xxiv
ANGLO-FRENCH DRUG CO., LTD.—Elixir Gabail - - - - - - xxiii
BAYER PRODUCTS, LTD.—'Prontosil' - - - - - - - viii
BERK, F. W. & CO., LTD.—Wheat Germ Oil - - - - - - iv
BOOTS PURE DRUG CO., LTD.—Iodized Mineral Salts - - - - - xii
BRITISH COD LIVER OIL PRODUCERS (HULL), LTD.—Sol-vit-ax - - - - xvii
BROWNE, DR. J. COLLIS—Chlorodyne - - - - - - - xxvi
BURROUGHS WELLCOME & CO.—'Wellcome' Canine Distemper Products - - - vii
DENVER CHEMICAL MANUFACTURING CO.—Veterinary Antiphlogistine - - - x
DIMOL (VETERINARY), LTD.—"Dianimol" Veterinary Preparations - - - - v
ELLIOTTS & AUSTRALIAN DRUG, LTD.—Mist. Argenti. Comp. - - - - vii
ENDOCRINES-SPICER, LTD.—Davenil - - - - - - - - xx
HEWLETT, C. J., & SON, LTD.—Parôphyroxiâ - - - - - - xiv
MENLEY & JAMES, LTD.—Vetiod - - - - - - - - xx
PARKE, DAVIS & CO.—Veterinary Tuberculins - - - - - - ii
PEAT PRODUCTS (SPHAGNOL), LTD.—Sphagnol Ointment - - - - - xxi
VITAFOODS LTD.—Vitafoods Cod Liver Oil Emulsion - - - - - - xiii
VITALITY VITAMIN LABORATORIES, LTD.—Renovita - - - - - xix

DOG AND HORSE FOODS.

AGRICULTURAL FOOD PRODUCTS, LTD.—Equivite - - - - - - xxv
CHAPPEL BROS., LTD.—Ken-L-Ration - - - - - - - - xxiii
SPILLERS, LIMITED—Saval - - - - - - - - - xi
SPRATT'S PATENT, LTD.—Various Products - - - - - - - xiii
STAMINA FOODS, LTD.—"Fullomeats," "Fullomilk" - - - - - xxii

SERUMS, VACCINES, ETC.

BRITISH DRUG HOUSES, LTD.—Tetanus Antitoxin Veterinary B.D.H. - - - xv
WILLOWS, FRANCIS, BUTLER & THOMPSON, LTD.—Vaccines for Small Animals - - iii

PUBLISHERS.

BAILLIÈRE, TINDALL & COX - - - - - - - - xvi, xviii, xxv
OXFORD UNIVERSITY PRESS - - - - - - - - - - xxi

MISCELLANEOUS.

AMALGAMATED DENTAL CO., LTD.—Castle Steriliser - - - - - xxii
ARNOLD & SONS—Operation Table - - - - - - - - ix
GLASGOW VETERINARY COLLEGE - - - - - - - - vii
ROYAL (DICK) VETERINARY COLLEGE, EDINBURGH - - - - - vi
ROYAL VETERINARY COLLEGE - - - - - - - - - xxv
SMITH, T. J., & NEPHEW, LTD.—Cellona - - - - - - - xv
THE LABORATORY, GORING, READING - - - - - - - - xix

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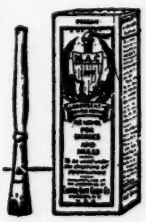

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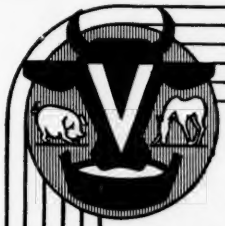

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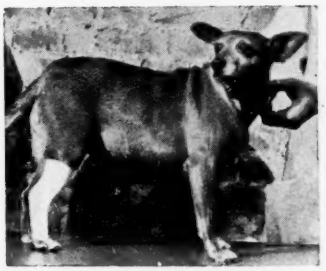

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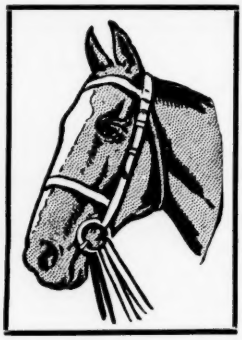

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